

Z/034/61/000/010/001/002
E112/E553

AUTHORS: Horčic, Karel, Engineer and Dvořáček, Josef

TITLE: Some problems of aluminium production

PERIODICAL: Hutnické listy, 1961, No.10, pp.710-715

TEXT: Present aluminium production in Czechoslovakia does not meet steadily increasing demands and projects for the building of additional plant, with special reference to available raw materials and their location, are discussed. The problem is presented in three main sections: 1) Production of aluminium oxide, 2) its conversion, by electrolysis, to aluminium, and 3) possibility of aluminium production by an electric furnace. Ad 1) Two processes are available for aluminium oxide production: the Bayer process which is only applicable to high-grade, SiO_2 -poor bauxites and the older fusion process which is limited to lower-grade bauxites. The aluminium works in Czechoslovakia are based on aluminium oxide, produced by the fusion process from lower-grade Hungarian bauxite. The process is more complicated, energy expenditure is higher and the material is not very well suited for electroconductive aluminium. A special desilication process is

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inserted in the Czechoslovak plant. It is suggested that lower grade bauxites may be processed by a combination of the Bayer and fusion methods, but difficulties may be encountered at some stages of the process, particularly during filtration of the residues of iron oxides. Production costs of aluminium oxide and aluminium are itemized, indicating that raw material costs are the decisive factor for aluminium oxide, while electric energy is the essential factor for aluminium. ✓

<u>Aluminium:</u>	
Raw-material	56% (from 80% Al_2O_3)
Electric energy	22%
Wages	3.9%
Maintenance	11.2%
Special costs	2.2%
Works overheads	4.7%
Total	100.0%

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<u>Aluminium oxide:</u>	
Raw materials (bauxite)	28%
Energy (electric, steam, water, air)	29%
Wages	5.5%
Maintenance	37.5%
Total	100.0%

The complex nature of the aluminium process is mirrored by high maintenance costs. Supplies of Hungarian bauxite are limited and domestic raw materials will have to be investigated. The kaolinites from the North Bohemian coal basin (dry contents: 30-35% Al_2O_3 , 40-45% SiO_2 , 2-10% Fe_2O_3 , 1-6% TiO_2) are, theoretically, of interest because of the relatively high Al content, but the high SiO_2 ratio, on the other hand, would necessitate a preliminary treatment. Although the process would be complicated, it is estimated that costs would not exceed that of the fusion process from low-grade bauxites. Reliable data could, however, be established only after prolonged pilot-plane experiments. It is generally estimated that aluminium production from domestic materials would require a period from 8 to 10 years

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before it could be established successfully. The purchase of bauxite from overseas may be necessary. Ad 2) The electrolytic process for aluminium production from Al_2O_3 is described in detail. Types of electrolytic cells are reviewed. Aluminium works ought to be built in the immediate vicinity of cheap electricity supply. The problem is complicated by the fact that power stations in Czechoslovakia are located in the more densely populated agricultural districts. The effects of the toxic anodic exhalations have to be carefully examined. These considerations would suggest that production units should not exceed an annual production of 100 000 tons of Al. In order to improve the economy of the electrolytic process, the use of semiconductor rectifiers and large electrolytic cells with an intensity of 100 kA are recommended. Ad 3) Discussion of electrothermic process. It should be possible, on theoretical considerations, to meet the entire Czechoslovak requirements of aluminium alloys (silumine, an alloy with silicium) from domestic raw materials (low-grade kaolines) by using the electric arc process. The construction of a high-capacity single-phase arc furnace remains the main problem. The purchase of a pilot-plant furnace from Eastern Germany is

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recommended. The results of some Soviet experiments with an
experimental furnace of 16 MVA should be awaited.

ASSOCIATION: Hutní projekt, Prague

SUBMITTED: July 11, 1961

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HORCICKA, M.

Technology of ore crushing. p. 54.

Vol. 4, no. 2, Feb. 1956

RUDY

Praha, Czechoslovakia

Source: East European Accession List. Library of Congress
Vol. 5, No. 8, August 1956

MANDIC, V.; HORCICKA, M.

Temporary prostheses in above knee amputations. Acta chir. Iugosl. 8
no.4:360-364 '61.

1. Ortopedska klinika Medicinskog fakulteta u Zagrebu (Predstojnik
prof. dr F. Grespic).

(ARTIFICIAL LIMB)

HORCICKA, Vaclav

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conveyers for Distance Transportation. Normalizace 11 no.5:
152 My '63.

1. Transporta, n.p., Chrudim.

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Measurement of the gastric evacuation time in ulcers by test meal. Vnitřní lek. 11 no.4s349-355 Apr 55.

1. Gastroenterologické laborator fakulty University Palackého v Olomouci (předseda: prof. MUDr. Vladimír Falík).

SVOBODA, Vladimir, inz.; HORCICKA, Zdenek, inz.

Gradient technology in using radio communication. Zel dop tech
12 no. 4: Supplement: no. 4:1-8 '64.

HORCZAK, T.

HORCZAK, T. More solicitude for the fishery school. p. 4. GOSPODARKA
RYBNA Warszawa, Poland. Vol. 8, No. 3, Mar. 1956

SOURCE: East European Accessions List (EEAL) LC Vol. 5, No. 6,
June 1956

HORCZYNSKA, E.

3
MTC (J2)

Distr: 4E2c(m)

Mechanism of deposition of ions from aqueous solutions.
E. Horczyńska, Inst. Badan Jądrowych, Warszawa, Poland.
Submitted for publication in the Journal of Electroanalytical Chemistry, 1974, 10, 1-4.
Abstract: The mechanism of deposition of metal ions from aqueous solutions on
metal and polymethyl methacrylate surfaces is studied.

metal and poly(methyl methacrylate) surfaces are well accounted for if adsorption is treated as an ion-exchange process. A metal is therefore assumed to be always covered by a layer of its compd., e.g., a hydroxide. Stacker

NGUYEN KHAC MAO; DROSTE, Z.; HORLEJUK, J.; TEISSEYRE, R.

Analysis of macroseismic phenomena and dynamic processes in the earthquake of June 12, 1961 in Vietnam. Acta geophys Pol 11 no. 1/2: 19-34 '63.

1. Institute of Geophysics, Polish Academy of Sciences, Warsaw.
2. Phu-Lien Observatory (for NGUYEN KHAC MAO).

DROSTE, Z.; DZIEWONSKI, A.; HORDEJUK, J.

Application of the capacity elements in the seismograph--
galvanometer system. Acta geophys Pol 11 nc. 1/2: 37-
'63.

1. Zaklad Geofizyki, Polska Akademia Nauk, Warszawa.

HORDEJUK, J.

Dynamic characteristics of the center of the earthquake of November 16, 1911.

P. 103. (ACTA GEOPHYSICA POLONICA.) Poland, Vol. 5, No. 2, 1957.

SO: Monthly Index of East European Accessions (ABEI) Vol. 6, No. 11, November 1957.

3(5)

POL/26-7-2-4/18

AUTHORS:

Droste, Z., Gibowicz, S., and Hordejuk, J.

TITLE:

Analysis of the First Movements of the Seismic Waves
Recorded on Seismographs

PERIODICAL:

Acta geophysica polonica, 1959, Vol 7, Nr 2, pp 136-
164 (POL)

ABSTRACT:

New problems developing in modern seismologic science require in many cases accurate knowledge of the true values of the amplitudes and periods of the first recorded movements of the seismic wave. These values are, as a rule, strongly deformed by instruments. Complete elimination of these distortions by computation is impossible at present owing to our lack of knowledge of the analytical shape of true ground movement. From recent research work it appears that the frequency characteristics computed for first ground vibrations do not show major dissimilarities. In order to simplify computation, a sinusoidal form of the ground vibrations will therefore be assumed in this investigation. Recent experimental material

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confirm the correctness of such an assumption. The purpose of this investigation is to examine the deformations in periods and first amplitudes caused by seismographs of various types. Two types of seismographs were examined. For the first type, seismographs with mechanical recording, the character of period and amplitude deformations in the first movement is shown in figure 15, the seismograph used being one with a free vibration period of 6 seconds and a damping constant of 0.1. The other type of apparatus investigated is the seismograph with galvanometric recording. The frequency characteristics in this case are illustrated in figures 19, 20, and 21. A full English summary appears on pp 157-164. There are 21 graphs and 7 references, 4 of which are Soviet, 1 Czech, 1 French, and 1 Polish


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POL/26-7-2-4/18
Analysis of the First Movements of the Seismic Waves Recorded on
Seismographs

ASSOCIATION: Instytut Geofizyczny Polskiej Akademii Nauk (Insti-
tute of Geophysics of the Polish Academy of Sciences)

SUBMITTED: April 10, 1959

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HORDEJUK, J.; PIOTROWSKI, J.

The new seismologic station in Chapa (Vietnam). Przegl geofiz 6 no.4:
291 '61

BOBR-MODRAKOWA, Irena [deceased] DROSTE, Zofia; HORDEJUK, Jozef

A formula for the determination of earthquake magnitudes from surface waves adopted by the Warsaw Observatory. Acta geophys Pol 9 no. $\frac{1}{2}$:154-159 '61.

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The importance of diagnosis in the treatment of chronic bronchitis.
Orv. hetil. 105 no.32:1508-1511 9 Ag '64.

1. Budapesti Orvostudományi Egyetem, Tudorjogyszati Klinika
es III. ker. Tanacs, Tudobeteggondozo Intezet.

HORDPOVA, J.; WEICHERT, J.

Studies of the vitamin K and vitamin E series. II. Analogues of the α -tokopherol with unbranched side-chains. p. 133. (Chemické Listy. Vol. 5, no. 1, Jan. 1957.)

SO: Monthly List of East European Accession (EEAL) LC, Vol. 6, no. 7, July 1957. Uncl.

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Determination of the mercury content in the grains of
cereals dressed and undressed with mercury preparations.
Roczn panstw zakl hig 14, no.3:221-224 '63.

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Zakl. hig. 16 no.5:461-466 '65

1. Z Zakladu Badania Zyznosc i Przedmiotow Uzytku Panstw-
wego Zakladu Higieny (Kierownik: prof. dr. M. Nikonorow).

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A rare case of orbital foreign body. Klin. oczna 33 no.2:
231-234 '63.

1. Z Kliniki Okulistycznej AM w Białymstoku Kierownik: prof.
dr med. M. Dymitrowska.
(ORBIT) (FOREIGN BODIES) (EYE INJURIES)

HORECKY, J.; HORECKA, E.

Hypothermic cardioplegia and deep hypothermia of the heart.
Bratisl. lek. listy 44 no. 4: 211-222 '64.

1. Experimentálne laboratórium Katedry chirurgickej prope-
deutiky Lek. fak. Univ. Komenského v Bratislave (vedúci: aka-
demik K. Siska) a Detské stredisko 4. polikliniky Mestského
ustavu národného zdravia v Bratislave (riadi: dr. M. Chorvat).

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HOUBAL, V.; HORECKA, J.; MORAVEK, V.

Studies on some liver diseases by means of non-specific reactions with sulfosalicyclic acid. Cesk. gastroent. vyz. 15 no.5:382-391 Ag '61.

1. Infekcni odd. KUNZ, fakultni nemocnice Brno-Bohunice, predn. doc. MUDr. V.Houbal Biochemicky ustav prirodovedecke fakulty v Brne, prednosta prof. RNDr. V. Moravek.
(SALICYCLIC ACID rel cpds) (LIVER FUNCTION TESTS)

SIMEK, Karel; HORECKA, Jana; Technická asistence: SMOLKALOVA, Marie

Heterohemagglutination in epidemic hepatitis. Scr. med. fac.
med. Brunensis 36 no.5:241-248 '63.

1. Katedra mikrobiologie lékařské fakulty university J.E.
Purkyne v Brně. Vedoucí katedry: MUDr. Lad. Jandasek, C.Sc.
Infekční klinika fakultní nemocnice v Brně-Bokunicích
Prednosta: prof. MUDr. Václav Houbal, Dr.Sc.
(HEPATITIS, INFECTIOUS) (HEMAGGLUTINATION)
(ANTIBODY FORMATION) (LIVER DISEASES)
(LIVER FUNCTION TESTS)

HORECKA, Jindrich

Steel lattice masts for the 22 kv overhead lines. Energetika
Gz 15 no.1:30-33 Ja '65.

1. Spojporjekt, Prague.

L 34070-00

ACC NR: AP6025847

SOURCE CODE: CZ/0017/66/055/002/0078/0082

AUTHOR: Horecky, Drahomir (Engineer)

ORG: Research and Development Institute of Rotary Electrical Machinery, Brno
(Vyzkumny a vyvojovy ustav elektrickych stroju tocovych)

TITLE: Certain factors are given for calculations of the mean reactive voltage upon assumption that the current changes in the commutator coil are linear

SOURCE: Elektrotechnicky obzor, v. 55, no. 2, 1966, 78-82

TOPIC TAGS: electronic commutator, voltage regulation, direct current, electric motor, armature, magnetic field

ABSTRACT: Small and medium ²⁹DC machines usually are equipped with commutating poles having flat pole-shoes which generate a magnetic field which neutralizes the mean value of the reactive voltage. That voltage can be calculated with given equations. To simplify the calculation, Richter introduced the factors \mathcal{K} and \mathcal{K}' . Calculated values for quite a restricted number of cases were published by him. At the Institute the values of \mathcal{K} and \mathcal{K}' were calculated for all used armature windings for small and medium DC motors, and those values are presented in annexed tables. This paper was presented by Professor, Engineer J. Chladek. Orig. art. has: 4 figures, 15 formulas and 6 tables. [Based on author's Eng. abstract] [JPRS: 35,327]

SUB CODE: 09 / SUBM DATE: 02Jul65 / ORIG REF: 007 / OTH REF: 004

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UDC: 621.318

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Použitie elektroniky (Applied Electronics) p. 430

TECHNICKA PRACA. Bratislava, Czechoslovakia, Vol. 7, No. 9, Sept. 1955

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Uncl.

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p. 44.

Vol. 8, no. 1, Jan. 1956
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Bratislava, Czechoslovakia

Source: East European Accession List. Library of Congress
Vol. 5, No. 3, August 1956

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SOURCE: East European Accessions List, Vol. 5, no. 9, September 1956

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Some remarks on the terminology of organic compounds. p. 61 (Chemicke Zvesti.
Vol. 11, no. 1 Jan. 1957) Bratislava

SO: Monthly List of East European Accession (EEAL) LC Vol. no. 7, July 1957, Uncl.

ROZHOLD, J.; ROZHOLD, Z.; PIVKOVA, A.; HORECKY, J.

Choice of perfusion flow in prolonged extracorporeal circulation. Bratisl. lek. listy 44 no.2:84-89 '64.

I. Chirurgické oddelenie Vojenskej nemocnice v Bratislave (veduci: MUDr. Z. Rozhold) a II. Chirurgická klinika Lek. fak. Univ. Komenského v Bratislave (veduci: akademik K. Siska).

X

PIVKOVA, A.; HORECKY, J.; ROZHOLD, J.; ROZHOLD, Z.

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experimental conditons. Bratisl. lek. listy 44 no. 4: 203-210
*64.

1. II. Chirurgicka klinika v Bratislave (veduci: akademik K.
Siska) a Vojenska nemocnica v Bratislave (veduci: MUDr.
Z. Rozhold).

*

HORECKY, J.; HORECKA, E.

Hypothermic cardioplegia and deep hypothermia of the heart.
Bratisl. lek. listy 44 no. 4: 211-222 '64.

1. Experimentálne laboratórium Katedry chirurgickej prope-
deutiky Lek. fak. Univ. Komenského v Bratislave (vedúci: aka-
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Department of cardiopulmonary surgery, Scientific Laboratory for the Research of Surgical Patophysiology, Medical Faculty, Comenius University (Oddelenie kardiopulmonalnej chirurgie vedeckeho laboratoria pre vyskum chirurgickej patofyziology Lekarskej fakulty Univerzity Komenskeho), Bratislava; Director: docent M. KRATPCHVIL, MD.

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"Changes of Brain and Peripheral Circulation in Oxygen Hyperventilation of the Lungs" (Preliminary Report)

HORECKY, J.

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CSSR

HORECKY, J.; SEVCIK, L.; STUBHA J.; MINARIKOVA, P.

Dept, for cardio-pulmonary surgery of the Scientific Laboratory for
research of surgical patophysiology at the Medical Faculty of Comenius
University, Bratislava (Oddelenie kardiopulmonalnej chirurgie Vedeckého
laboratória pre výskum chirurgickej patofyziológie Lek.fak. Univ.
Komenského), director: docent M. Kratochvíl, MD

Bratislava, Bratislavské Lekárske Listy, No 7, 1963, pp 385-393

"The Importance of Hypothermia in Bohemia Anoxia of the Myocardium"

CZECHOSLOVAKIA

HONECKY, J.

Department of Cardiopulmonary Surgery of the Laboratory
of Higher Surgical Pathophysiology of the Medical
Faculty of Komensky University (Oddelenie kardio-
pulmonalnej chirurgie laboratoria pre vyskum chirurgickej
patofyziologie Lek. fak. Univ. Komenskeho), Bratislava

Bratislava, Bratislavske lekarske listy, No 8, 1963, pp 462-
468

"The Effect of Selective Cooling of the Brain on the Degree
of Oxygen Utilization from the Blood of the Cerebral
and Corporeal Circulation."

4

CZECHOSLOVAKIA

ROZHOLD, Z; ROZHOLD, J; PIVKOVA, A; HORECKY, J; BROZMAN, M.

1. Surgical Ward of the Military Hospital (Chirurgické oddelenie Vojenskej nemocnice), Bratislava (for Rozhold); 2. Second Surgical Clinic of the Medical Faculty of Komensky University (II. chirurgická klinika Lek. fak. Univ. Komenského), Bratislava; 3. Institute of Pathological Anatomy of the Medical Faculty of Komensky University (Ústav patologické anatomie Lek. fak. Univ. Komenského), Bratislava (for Brozman)

Bratislava, Bratislavské lekárske listy, No 11, 1963, pp 662-669

"The Use of Extracorporeal Circulation for Regional Perfusion with Chemotherapeutics in Malignant Tumors."

HORECKY, J.; Technická spolupráca: MALINOVÁ, E.

Effect of selective cooling of the brain on the degree of oxygen utilization from the cerebral and corporeal circulation. Bratisl. lek. listy 43 Pt. 1 no.8:462-471 '63.

1. Oddelenie kardiopulmonálnej chirurgie laboratória pre výskum chirurgickej patofyziologie Lek. fak. Univ. Komenského v Bratislave, veduci doc. MUDr. M. Kratochvíl.

(BRAIN) (HYPOTHERMIA, INDUCED)
(ENERGY METABOLISM) (TISSUE METABOLISM)
(ISOLATION PERFUSION) (BODY TEMPERATURE)
(OXIMETRY) (BLOOD PRESSURE) (DOGS)
(CEREBROVASCULAR CIRCULATION)

HORECKY, J.; PIVKOVA, A.

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lek. listy 43 Pt. 2 no.4:221-226 '63.

1. Experimentálne laboratórium Katedry II chir. kliniky Lek.
fak. Univ. Komenského v Bratislave, vedúci akademik ČSAV
K. Siska.

(BRAIN) (TISSUE METABOLISM)
(ENERGY METABOLISM) (HYPOTHERMIA, INDUCED)
(CEREBROVASCULAR CIRCULATION)
(BLOOD VISCOSITY)

HORECKY, J.; PIVKOVA, A.

Blood flow changes during hypothermic brain perfusion. Bratisl.
lek. listy 43 Pt. 2 no.5:260-270 '63.

1. Experimentálne labororium Katedry II chirurgickej kliniky
Lek. fak. Univ. Komenského v Bratislave, veduci akademik
K. Siska.

(PERFUSION) (CAROTID ARTERIES)
(HYPOTHERMIA, INDUCED)
(CEREBROVASCULAR CIRCULATION)

HORECKY, J.; PIVKOVA, A.; ROZHOLD, J.; ROZHOLD, Z.

Effect of extracorporeal cardiopulmonary by-pass on the healthy body in experimental conditions. Bratisl. lek. listy 44 no.6: 358-368 30 S '64.

1. Experimentálne laboratórium Katedry II. chirurgickej kliniky Lek. fak. Univerzity Komenského v Bratislave, (vedúci akademik K. Siska) Chirurgické oddelenie Vojenskej nemocnice v Bratislave, (vedúci MUDr. Z. Rozhold).

HORECKY, J. Technicka spoluprace TROCHTA, L.

Heat exchange in regional perfusion. Rozhl.chir. 44 no.1:51-63
Ja '65

1. Experimentálne labororium II. chirurgickej kliniky Lekárskej
fakulty University Karlovy v Bratislave (prednosta: akademik
K. Siska).

SUJANSKY, E.; HORECKY, J.; SILVAY, J.

Vascular tonus changes during selective hypothermia of brain.
Bratisl. lek. listy 45 no.11:666-671, 15 Ja '65.

1. Ustav experimentalnej chirurgie Slovenskej akademie vied
v Bratislave (riaditeľ: akademik K. Siska, Dr.Sc.) a Exp. laborat-
orium II. chirurgickej kliniky Lekárske fakulty Univerzity
Komenského v Bratislave (vedúci: akademik K. Siska, Dr.Sc.).

HAVIAR, V.; ZAJAC, M.; HORECKY, J.; PIVKOVA, A.; ROZHOLD, J.; ROZHOLD, Z.

Use of a pump oxygenator in the treatment of patients with cor pulmonale complicated by hepercaphnia and respiratory acidosis. Bratisl. lek. listy 45 no.6:367-371 30 S '65.

1. Z II. int. kliniky Lek. fak. Univerzity Komenského v Bratislave (veduci prof. MUDr. V. Haviar) z II. chir. kliniky Lek. fak. Univerzity Komenského (veduci prof. MUDr. K. Siska) a z chir. odd. Vojenskej nemocnice v Bratislave (veduci MUDr. Z. Rozhold).

HORECNY, K.

Normal mineral values in the urine of infants. Bratisl. lek.
listy 44 no.1:37-42 '64.

1. Katedra pediatrie II. lek. fak. Univ. Komenského v
Bratislave; veduca: prof. MUDr. J. Michalickova.

HORECNY, K.

HECKO, I.; HORECNY, K.; PENIAZKA, J.

A continuous unevenly distributed cyanosis in a newborn caused
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Ja-F '50. (GLML 19:3)

1. Of the Children's Clinic and of Pathologico-Anatomical Institute
of Slovak University in Bratislava.

HORECNY, K.

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1952. (CJML 24:3)

1. Of the Pediatric Clinic of Slovak University, Bratislava.

HORECHY, K.; WAGENHOFER, E.

Diagnostic examination of the cerebrospinal fluid in children.
Bratisl. lek. listy 34 no.2:148-168 F '54.

1. Z Detskej kliniky LFSU v Bratislave, prednosta doc. dr
J. Michalickova.

(PEDIATRIC DISEASES, cerebrospinal fluid in,)

*
(CEREBROSPINAL FLUID, in various diseases,
*pediatric dis.)

HORECNY, K.

HORECNY, K.; WAGENHOFER, E.

Possibilities and importance of electrophoresis in determination of blood proteins in pediatrics. Bratisl. lek. listy 34 no.5:497-510 My 54.

1. Z II. detskej kliniky LFSSU v Bratislave, prednosta doc. dr. J. Michalickova.

(BLOOD PROTEINS, determination,
electrophoresis in inf. & child.)

(ELECTROPHORESIS,
of blood proteins in inf. & child.)

BREUER, E.; HORSENY, K.; WAGENHOFER, E.

Aldolase test in children. Cesk. pediat. 13 no.9:803-805 5 Oct 58.

1. II. detska klinika LFUK v Bratislave, prednosta doc. Dr. Jaroslava
Michalickova.

(DESMOLASES

zymohexase test in child., diag. value (Cz))

HORECNY, K.

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J. Michalickova.

(INFANT NUTRITION)
(PROTEINS metab)

HORECNY, K.; Techn. spolupraca: SULKO, M.

Apropos of the further "humanization" of artificial nutrition
for infants. I. Optimum protein supply. Bratisl. lek. listy 44
no.3:129-138 15 Ag '64.

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(veduca prof. MUDr. J. Michalickova)

HORECNY, K.

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1. Second Paediatric Clinic Medical Faculty, Comenius University, Bratislava. Director: Doc. Dr. J. Michalickova.
(INFANT NUTRITION) (PROTEINS nutrition & diets)

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Vol. 11, no. 12, Dec. 1956

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SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 8, Aug 1957. Uncl.

AUTHOR: Hořejš, Slavomír, Ing. CZECH/34-59-7-22/22

TITLE: The Dependence of the Hardness Distribution on the Microstructure in the Head of Surface-Hardened Rails
(Souvislost průběhu tvrdosti v hlavě povrchově kalených kolejnic s mikrostrukturou)

PERIODICAL: Hutnické Listy, 1959, Nr 7, pp 649-656 (Czechoslovakia)

ABSTRACT: Czechoslovak Metallurgical Report, Nr 7, July, 1959.
One of the possible methods of heat treatment of rails is to harden the surface by quenching the railhead from the temperature of the rail at the end of the rolling process and to temper it by means of the internal heat of the core of the rail and the railhead. This method is applicable both for hardening the ends of rails and also for hardening the running surface of the railhead. Experience gained during 1953 and 1954 at the Vítkovice Iron Works (Ref 1) has shown that the hardness does not decrease continuously with the depth as it should; at a certain depth below the running surface the drop in hardness stops and there is a rise in the hardness with depth which is followed by a continuous slow drop in hardness towards the centre of the railhead. Since it is

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known from literature (Ref 2) that, in surface hardened rails, the surface hardened layer frequently peels off and there may even be slip of the hardened layer in the longitudinal direction followed by chipping off, the author of this paper considered it of interest to investigate the cause of the transient increase in hardness and the relation between this increase and the applied hardening process. Most authors do not mention the presence of a transient increase in hardness at a certain depth below the running surface, however, H. O'Neill (Ref 3) reported that he detected a transient increase in the hardness of surface hardened rails with carbon contents of 0.50 to 0.55% and manganese contents of 1.10 to 1.20%. His results are reproduced in the graph, Fig 1, p 649. The author of this paper carried out tests under laboratory and normal operation conditions. The equipment used in the experiments was described in an earlier paper. It consisted of a sheet steel box, one side of which was provided with holes, the

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shapes of which were adapted to the shape of the railhead. Asbestos lining prevented penetration of the water to the vertical and the bottom parts of the rail. In the laboratory experiments, rail sections of about 500 mm length were used with chemical compositions as enumerated in Table 1; for two of these the hardness as a function of the depth is graphed in Fig 2, whereby one of the rails was quenched for 27 secs from 830 °C, the other was quenched for 45 secs from 830 °C. For the spots designated by arrows in this graph, microstructure photographs were taken which are reproduced in Figs 3 and 4. Comparison of the microstructure with the hardness characteristic shows that the zone of maximum hardness, directly below the running surface, consists of pure sorbite (Fig 3a, 4a), whilst at the spots of relative minimum hardness the structure was found to be bainitic. The beginning of the second increase in hardness is characterized by the appearance of fine pearlite (troostite), Figs 3b and 4b, in continuously increasing quantities until fine pearlite is

Card 3/6 the only structural component in the region of the relative

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hardness maximum, Fig 3e. Then, towards the core of the railhead, the inter-lamellar distance increases gradually and so does the quantity of pro-eutectic ferrite at the grain boundaries. According to O'Neill, the formation of a pronounced bainitic zone is due to the transformation characteristics of a given steel during continuous cooling. If this were true, a similar phenomenon should occur in Jominy test rods made of the same material. However, results, shown in Fig 5, confirm the known fact that for these steels Jominy test specimens do not show a transient increase in hardness, i.e. that the explanation of O'Neill is incorrect. On the basis of the obtained results it is concluded that:

1) A condition for the occurrence of a pronounced bainite zone is the existence of an austenite zone (possibly with a certain quantity of bainite) under the martensite zone at the instant when the quenching is stopped. During subsequent tempering by the internal heat of the rail, this austenite becomes transformed into bainite. Thus,

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a determining factor on whether a pronounced bainite zone occurs is the mutual relation between the quenching time and the hardenability of the used steel.

2) The formation of a relative minimum and a relative maximum is due to the fact that during tempering the hardness of the bainite drops faster than that of fine pearlite so that even after a few seconds the hardness of the bainite will be lower than the hardness of the fine pearlite.

3) The occurrence of a relative minimum and a relative maximum on the hardness curves in the cross-section of a surface hardened rail is not a necessary condition for the existence of a relative maximum and a relative minimum on the hardness curve obtained on a Jominy specimen hardened by current methods. However, if the hardening time is shortened, Jominy specimens will also show relative minima and relative maxima of the hardness.

4) The formation of a bainite zone, and thus also the formation of a relative minimum and maximum of hardness,

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duration (if this is possible without exceeding the maximum permissible hardness of the tempered martensite, which should not exceed 400 HB), or by reducing the hardenability of the used steel to $D_1 \leq 35$ mm.

5) Practical experience gained in 2 1/2 years rail operation indicates that the presence of the bainite zone in the hardened ends of rails does not affect adversely the rail performance on the track.

There are 13 figures, 2 tables and 10 references, 2 of which are Czech, 5 English and 3 German.

ASSOCIATION: Výzkumný ústav VŽKG, Ostrava
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SUBMITTED: March 4, 1959 ✓

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railroads. Hut listy 17 no.4:231-239 Ap '62.

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PUNCOCHAR, Z., inz.; HRBEK, A.; CHVATAL, Vlad., inz.; VETSIKA, A.; KECLIK, V.;
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KRUMNIKL, F.; HOREJS, S., inz.; TEINDL, J.; SESTAK, B.

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Wheel tires highly resistant to wear for electric locomotives.
Zel dop tech 12 no. 4:92-94 '64.

L 21356-66 EWA(d)/EWP(t) JD

ACC NR: AP6010889

SOURCE CODE: 01/0034/65/000/008/0554/0562

AUTHOR: Motloch, Zdenek (Engineer); Horejs, Slavomir (Engineer, Candidate of sciences)

ORG: Metallurgical Research Institute Klement Gottwald Vilekovic Iron Works, Ostrava
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TITLE: Properties of rails made from vacuum degassed steels

SOURCE: Hutnicke listy, no. 8, 1965, 558-562

TOPIC TAGS: tensile strength, steel, wear resistant ferrous metal, toughness, vacuum degassing, carbon steel, chemical composition, metal rolling, fabricated structural metal

ABSTRACT:

offers both a better quality product and a more economical production method. Rails made from degassed steel and air-cooled after rolling show an improved tensile strength, higher toughness, and better wear resistance than rails made from ordinary steel and cooled slowly in pits. Certain differences found in the properties of samples taken from various spots in a single billet are explained by changes in chemical composition in the respective parts of the billet. Practical experience with the rails shows that double the length of life can be expected from these rails than from those made from carbon steel that was not degassed. Orig. art. has: 6 figures and 5 tables. [JPRS]

SUB CODE: 13, 11, 07 / SUM DATE: none / ORIG REF: 003 / SOV REF: 001
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UDC: 669.421.669.188

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15 no.9:insert S'63.

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No. 9, Sept. 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 11,
November 1959.

Uncl.

L 30111-66 T/EWP(t)/ETI IJP(c) JD
ACC NR: AP6020593 SOURCE CODE: CZ/002B/65/000/006/0325/0338
AUTHOR: Horejs, Jiri (Brno) 38
ORG: none B
TITLE: Relation of form and content in mathematics and logic. I
SOURCE: Pokroky matematiky fyziky a astronomie, no. 6, 1965, 325-338
TOPIC TAGS: mathematic logic, mathematics, applied mathematics
ABSTRACT: The article points out the problem and meaning of mathematical formulations of theory and discusses certain main conclusions of classical mathematics of logic and new tendencies (mechanical mathematics). Orig. art. has: 1 table. [JPRS]
SUB CODE: 12 / SUBM DATE: none / ORIG REF: 001 / OTH REF: 003
SOV REF: 003

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lek.cesk. 91 no.14:427-432 4 Apr 52.

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amino nitrogen balance in liver dis., eff. of diet)

(LIVER, diseases,

amino nitrogen balance, eff. of diet)

(DIETS, in various diseases,

liver dis., eff. on amino nitrogen balance)